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## (54) IMPROVEMENTS IN A MOTOR-CAR EXHAUST

(71) We, CHRYSLER FRANCE, a French Body Corporate, of 136, Avenue des Champs Elysées — 75008 Paris, France, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a motor-car exhaust.

The invention provides a motor-car exhaust having an exhaust pipe formed in two portions, a two part ball-joint interconnecting the two portions, at least two members secured or welded to the two exhaust pipe portions respectively, each member being in the form of a strip and having an extension portion extending parallel with the center-line of the exhaust pipe ball-joint interconnection, and a tension spring connected to the two extension portions of said members to hold together the two associated parts of the joint.

In the case of a single exhaust, each said flat strip or bar may for example be in the shape of a half-ring welded round one of the said exhaust pipe portions, said half-ring being provided at its ends with two lateral extensions located in the diametral plane of the half-ring and to which the ends of two springs are attached or hooked.

Each of the members constituting the device is simple to make, and the assembly can be rapidly mounted on the exhaust after the ball-joint is formed.

In the case of a twin exhaust, each of the said strips or bars may be in the shape of a T, the arms of which are secured or welded to, respectively, each of the two pipes constituting one of the parts of the twin exhaust, and the leg of which, substantially parallel with the direction of the exhaust at the place of connection, constitutes the extension on which the end of

the said spring is attached.

The invention will be better understood and other purposes, details and advantages thereof will appear more clearly from the following explanatory description made with reference to the accompanying diagrammatic drawings given solely by way of non limitative example illustrating various presently preferred specific forms of embodiment of the invention and wherein:

— Figures 1 and 2 are top and side views, respectively, of part of a motor-car single exhaust; and

— Figures 3 and 4 are similar views of part of a twin exhaust.

In the case of a single exhaust, as illustrated in Figures 1 and 2, a ball-joint 155 is constituted by fitting into one another the two part-spherically deformed, female and male ends 152b and 152a, respectively, of the two portions of an exhaust or tail pipe designated by 152i and 152e, respectively. A connection device 151 is constituted by two springs 153 and 154 of the helical draw type, the direction of which is substantially parallel with the centre-line of the ball-joint 155; the ends of the spring 153 are respectively attached or hooked to the lateral extensions confronting one another on either side of the ball-joint, 156a and 157a, of two half-rings 156 and 157, one of which is secured to the pipe 152i upstream of the ball-joint with respect to the flow of the gases, the other being secured to the pipe 152e downstream of the said ball-joint. The ends of the spring 154 are attached or hooked to two other lateral, mutually confronting extensions 156b and 157b, respectively, of the said half-rings, diametrically opposed to the extensions 156a and 157a, respectively.

The half-rings 156 and 157 are secured to the exhaust pipe by any suitable means, for example by welding, after forming the ball-joint. Of course, the small strips or

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bars to which the ends of the springs are attached may have any other suitable configuration. For example, they may be in the shape of rings completely encircling the exhaust pipe and provided with two diametrically opposed extensions for attaching or hooking the springs. In this case, the rings are placed around the parts of the exhaust pipe before spherically deforming the ends of the latter and forming the ball-joint, and, if appropriate, the rings are fixed in position after the ball-joint is formed.

The strips or bars are preferably positioned so that the springs which are hooked to the extensions lie generally in a plane also containing the centre-line of the ball-joint. This positioning allows the space occupied by the assembling device to be reduced to a minimum and the exhaust pipe to be placed in the highest possible position.

Of course, the number of mutually confronting extensions and therefore of the springs can vary depending upon the particular problem set by each vehicle.

On the other hand, the bar or strip to which the springs are hooked may have any shape allowing the space occupied by the assembling device to be reduced to a minimum and ensuring mutual counterbalancing of the tractive forces acting upon either side of the exhaust pipe.

In the case of a twin exhaust, as illustrated in Figures 3 and 4, the small strips or bars 158 and 159 confronting one another on either side of the ball-joint are T-shaped. The arms 158c and 158d of the T formed by the strip 158 are secured to the pipes 152k and 152m constituting the upstream portion of the double exhaust with respect to the ball-joint. The leg of the T formed by the strip 158 constitutes the extension 158a to which the end of the spring 163 is hooked. The other end of the spring 163 is hooked to the extension 159a of the T-shaped strip 159 secured substantially symmetrically with respect to the ball-joint to the pipes 152n and 152p constituting the twin exhaust downstream of the joint.

As clearly indicated in Figure 4, two springs 163 and 164 may contribute to resiliently assembling the ball-joint by using two pairs of flat T-shaped strips or bars 158 and 159, 160 and 161 confronting one another above and below the exhaust pipes. The use of two pairs of such strips or bars ensures mutual counterbalancing of the tractive forces acting on the ball-joint.

#### WHAT WE CLAIM IS:—

1. A motor-car exhaust having an exhaust pipe formed in two portions, a two-part ball-joint inter-connecting the two por-

tions, at least two members secured or welded to the two exhaust pipe portions respectively, each member being in the form of a strip and having an extension portion extending parallel with the center-line of the exhaust pipe ball joint interconnection, and a tension spring connected to the two extension portions of said members to hold together the two associated parts of the joint.

2. An exhaust according to claim 1, wherein the said tension springs are coil springs.

3. An exhaust according to claim 1 or claim 2, wherein each strip member is in the shape of a half-ring welded to one of the said exhaust pipe portions and surrounding the latter, the said half-ring being provided at its ends with two lateral aforesaid extension portions located in the diametral plane of the half-ring and to which the ends of two aforesaid springs are attached or hooked.

4. An exhaust according to any one of claims 1 to 3, wherein each strip member is in the shape of a ring surrounding one of the said exhaust pipe portions and provided with two lateral aforesaid extension portions located in a diametral plane of the ring and to which the ends of the two aforesaid springs are attached or hooked.

5. An exhaust according to any one of claims 2 to 4, wherein the said strip members are positioned so that the springs attached or hooked to the said extension portions lie generally in a plane also containing the centre-line of the ball-joint.

6. An exhaust according to claim 1 or claim 2, and in the case of a twin exhaust, wherein each said strip member is in the shape of a T, the arms of which are secured or welded respectively to each of the two pipes constituting one of the portions of the twin exhaust, and whose leg extending in substantially parallel relationship to the direction of the center-line of said exhaust in the region of the joint constitutes the said extension to which the end of the said spring is attached.

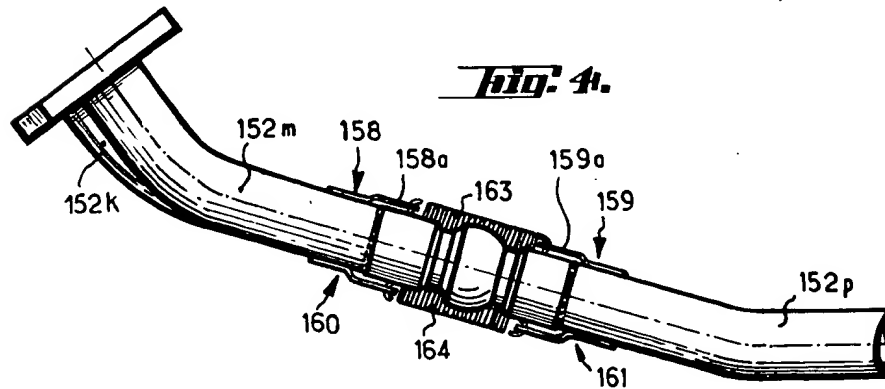
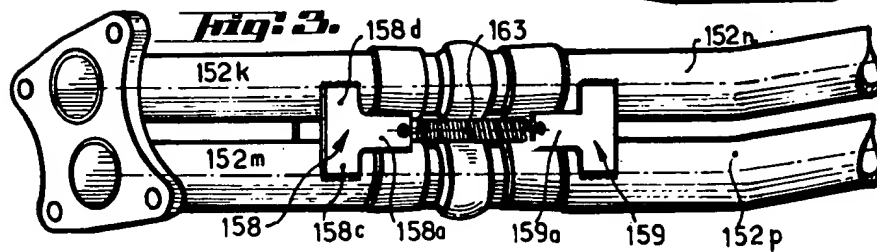
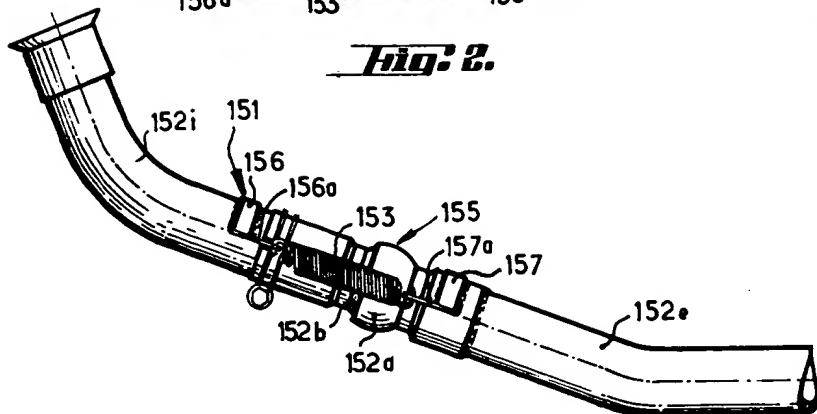
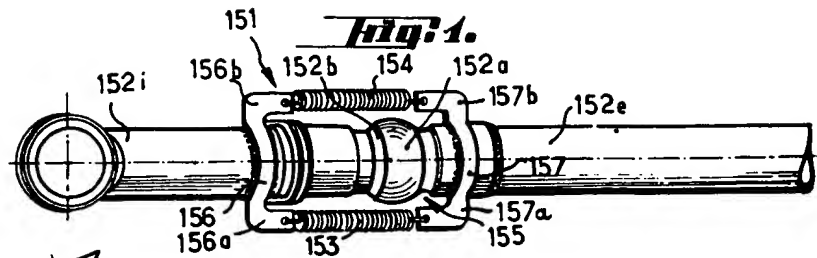
7. An exhaust according to claim 6, having two pairs of said strip members confronting one another on either side of the center-line of the said exhaust in the region of the joint.

8. An exhaust substantially as described with reference to and as illustrated in the accompanying drawings.

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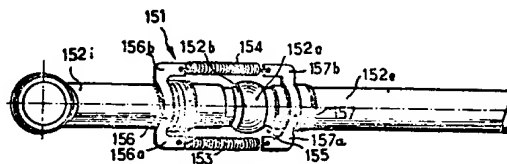
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CHRY ★ Q67 C0338A/10 ★ GB 1502-934  
 Exhaust with two pipes joined by ball joint - has a strip on each pipe  
 and springs connected between both strips  
 CHRYSLER FRANCE 11.05.76-GB-019398  
 (08.03.78) F161-27/04

The motor car exhaust has an exhaust pipe forward in  
 two portions (152i, 152e) which are interconnected by a two



part ball joint (152a, 152b). At least two strips (156, 157)  
 are secured to or welded to the two exhaust pipe portions  
 respectively. Each strip has an extension portion parallel  
 with the centre line of the exhaust pipe ball joint inter-  
 connection.

A tension spring (153, 154) is connected to the two ex-  
 tension portions to hold together the two associated parts  
 of the joint. Preferably the tension springs are coil  
 springs. Each strip may have the shape of a half ring whi-  
 -ch is welded to a pipe portion. Each end of the half ring  
 may carry one of the extensions. 11.5.76. as 019398 (3pp  
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